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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,298	02/18/2004	Kenji Noda	81863.0027	4817

26021 7590 05/09/2006

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EXAMINER
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MILLER, DANIEL H

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/781,298

Applicant(s)

NODA, KENJI

Examiner

Daniel Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/16/2004.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yong (U.S. 6,361,873) in view of Sue (U.S. 6,063,502).
3. Yong teaches a composite structure, cutting tool, which comprises a core material (first phase) and a second phase (shell) (column 3 line 50-58). The core layer can comprise Poly Crystalline Diamond (PCD) and metal alloys of Fe (column 3 line 59-68; column 4 lines 15, and 30-37). The second phase (shell), which is a different material, also contains PCD, and nitrides and carbides of Group 4a and 5a, and Fe groups. Yong further teaches that in embodiments that contain PCD it is known to use a high concentration in the core material and a lesser amount of PCD as you move away from the first phase, into the shell (column 8 line 45-54). The reduction of PCD concentration reduces residual stress due to mismatches in thermal expansions (column 8 line 55-59). Therefore, it would be obvious to a person of ordinary skill in the art to via routine experimentation optimize the concentration of diamond as claimed in applicants claim 1 in order to reduce residual stress due to mismatches in thermal expansions.

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4. However, the reference is silent as to the diamond particle size or the dimensions of the core material.

5. Sue teaches a composite construction formed from fibrous rods formed from a core material and an outer shell also used in cutting tools (abstract). The average (mean) particle size of the diamond powder is about 4 to 100 microns (example 2), which the examiner is interpreting to make obvious less than 3.5 and 5 microns.

6. It would have been obvious to combine the teachings of Yong and Sue because both are composite cutting tool, and Yong teaches it is important to control particle size to maximize toughness (column 1 line 62-66), and Sue teaches a specific particle size desired for cutting tool applications is known in the art.

7. Regarding claim 2-4, although the references are silent with respect to the ratios claimed it would be obvious to optimize those ratios as the filaments are envisioned to have a large fluctuation in width, length and thickness.

8. Regarding claim 5, Sue teaches stacked rod fused together (figure 2).

9. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yong (U.S. 6,361,873) in view of Sue (U.S. 6,063,502) and further in view of Rigali (U.S. 6,709,737).

10. Yong and Sue, discussed above, are silent as to the stacks of rods or core structures being in sheets or alternately stacked.

11. Regarding claim 6-8, Rigali teaches a composite material (abstract) comprising filaments that are stacked (see figures 4-7). The filaments can be manipulated into

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sheets (column 9 line 5-18) and can be stacked into layers of sheets wherein the layers have different orientations of the filaments (column 10 line 1-8). The invention of Rigali provides improved wear resistance and damage tolerance and mitigates impact damage. Therefore, it would have been obvious to modify the teachings of Yong and Sue as taught by Rigali because it would provide improved wear resistance and damage tolerance and mitigates impact damage inherently caused in operation of a cutting tool.

12.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Miller whose telephone number is (571) 272-1534. The examiner can normally be reached on M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Miller



JENNIFER C. MCNEIL  
SUPERVISORY PATENT EXAMINER

4/28/06